

4.0 CUMULATIVE EFFECTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

4.1 CUMULATIVE EFFECTS ANALYSIS

Council on Environmental Quality (CEQ) regulations stipulate that the cumulative effects analysis in an Environmental Impact Statement (EIS) should consider the potential environmental impacts resulting from “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 Code of Federal Regulations [CFR] 1508.7). Chapter 3.0 discussed the baseline conditions and potential effects of the Proposed Action and alternatives on environmental resources. This chapter identifies and evaluates projects that are reasonably foreseeable that could cumulatively affect environmental resources in conjunction with the Airspace Training Initiative (ATI).

Assessing cumulative effects begins with defining the scope of other actions and their interrelationship with the Proposed Action or alternatives (CEQ 1997). The scope must consider other projects that coincide with the location and timetable of the Proposed Action and other actions. Cumulative effects analyses evaluate the interactions of multiple actions. The first steps of the environmental impact analysis process helped identify other potential and planned actions. During scoping, the public and agencies were asked to provide information about ongoing regional projects and the potential interaction of the Shaw Air Force Base (AFB) ATI with such projects. These initial discussions defined the region of influence (ROI) for ATI, which in turn defined what actions should be considered cumulatively. The ROI for cumulative effects would have both spatial and temporal dimensions.

The CEQ (1997:9) identified and defined eight ways in which effects can accumulate: time crowding; time lag; space crowding; cross boundary; fragmentation; compounding effects; indirect effects; and triggers and thresholds. Furthermore, cumulative effects can arise from single or multiple actions, and through additive or interactive processes (CEQ 1997:9).

Actions not identified in ATI as the Proposed Action but that could be considered as actions connected in time or space (40 CFR 1508.25) (CEQ 1997:4) may include projects that affect the airspace. This would include the shape or use (such as commercial use) of airspace in and near the proposed ATI airspace or actions that affect environmental resources under the airspace. Cumulative actions could also include projects in the vicinity of the proposed training transmitter sites.

This EIS analysis addresses three questions to identify cumulative effects:

1. Does a relationship exist such that elements of the Proposed Action or an alternative might interact with elements of past, present, or reasonably foreseeable actions?
2. If one or more of the elements of the Proposed Action and another action could be expected to interact, would the Proposed Action or an alternative affect or be affected by impacts of the other action?

3. If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the Proposed Action or an alternative is considered alone?

An effort has been made to identify all actions that are being considered and that are in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the ATI Proposed Action or an alternative, these actions are included in this cumulative analysis. This approach enables decisionmakers to have the most current information available so that they can evaluate the environmental consequences of the Proposed Action.

4.1.1 Past, Present, and Reasonably Foreseeable Actions

This EIS applies a stepped approach to provide decisionmakers with not only the cumulative effects of the Proposed Action but also the incremental contribution of past, present, and reasonably foreseeable actions.

4.1.1.1 SHAW AFB AND OTHER MILITARY ACTIONS

PAST AND ONGOING MILITARY ACTIONS

Recent past and ongoing military action in the region were considered as part of the baseline or existing condition in the ROI. As presented in Table 4.1-1, these actions were considered for their relevance to ATI. Each project (summarized in this section) was reviewed to consider the implication of each action and its synergy with the Proposed Action and alternatives. Of particular concern were potential overlap in affected area and project timing. Shared aircraft operations were also a consideration.

Table 4.1-1. Past, Ongoing, and Reasonably Foreseeable Military Actions

<i>Action</i>	<i>Reference¹</i>	<i>Potentially Relevant to ATI</i>
Poinsett Electronic Combat Range (ECR) system capability and environmental management enhancement	Air Force 1994 Air Force 2001f	NO
Force Structure Change at Shaw Air Force Base, Sumter, South Carolina	Air Force 1996	YES
Changes in airspace utilization for specific Military Training Routes (MTRs) and Military Operations Areas (MOAs) managed by the 20th Fighter Wing (20 FW)	Air Force 2002	YES
Force Structure Change at Shaw Air Force Base, South Carolina	Air Force 2002	YES
Construction of an assault landing strip at Dobbins Air Reserve Base, Georgia	Air Force Reserve 2003	NO
Decision to base Super Hornets (F/A-18E/F) at Oceana	Navy 2003	YES
Training chaff and flares in existing airspace at Shaw AFB	Air Force 2003	YES
Employment of a Mobile Laser Evaluator System (LES-M) for the 20th Fighter Wing at Shaw Air Force Base, South Carolina	Air Force 2004	NO
Modification to the Coastal MOA	In Process	NO
Wing Infrastructure Development Plan (WINDO) covering infrastructure projects at Shaw AFB and Poinsett ECR	Air Force 2005	NO
Base Realignment and Closure Action as a reasonably foreseeable action	In Process	YES

Note: 1. Full citations are provided in Chapter 5.0, References.

1994 to 2004 Poinsett ECR System Capability and Environmental Management Enhancements

In 1994, a land exchange with the State of South Carolina was negotiated increasing range property from approximately 7,500 acres to 12,521 acres. In 2000, construction of a new tactical target complex (South Target Array) was completed. The Weapons Impact Scoring System, a television ordnance scoring system, was installed in 2003 for the North Target Array. The following year, two towers were constructed and Weapons Impact Scoring System cameras were installed for the South Target Array. Management of the range's natural resources has been defined in the Integrated Natural Resources Management Plan (INRMP) Fiscal Year (FY) 2001-2005, including threatened and endangered species management, forest management, and wildland fire management (Air Force 2001f).

1996 Force Structure Change

Shaw AFB is an active military installation that undergoes continuous change in mission and in training requirements. This process of change is consistent with the United States Defense policy that forces must be ready to respond to threats to American interests throughout the world. In the past eight years, two force structure changes have occurred at Shaw AFB. In 1996, the number of A/OA-10s was reduced from 39 to 18 Primary Aircraft Inventory (PAI) aircraft (Air Force 1996). The United States Air Force (Air Force) also increased the number of F-16s at Shaw AFB from 54 to 78 Primary Assigned Inventory (PAI) Block 50 aircraft by the end of August 1996. Sortie-operations in the Poinsett Electronic Combat Range (ECR), two Military Operations Areas (MOAs), and one Military Training Route (MTR) did not noticeably change as a result of the 1996 actions. Sortie-operations in two Warning Areas, three MOAs, and 24 MTRs increased slightly. Base personnel increased by 97 from 5,892 to 5,989 persons as a result of these 1996 actions.

2002 Changes in Airspace Utilization

Also in 2002, Shaw AFB received approval from the Federal Aviation Administration (FAA) for changes to utilization of several existing airspace units under the management of the 20th Fighter Wing (20 FW). The action, environmentally assessed in 2001, included adjustments in the altitude of three MTRs and extension of the operating hours for six MOAs. The three MTRs were Visual Routes (VRs) -087, -088, and -1060, which overlie counties in South Carolina, North Carolina, and Virginia. The proposal also increased the ceilings of each MTR to 6,500 feet above ground level (AGL). The six MOAs receiving the extension of operating hours were Gamecock B, C, D, and E MOAs and the Bulldog A and B MOAs. The proposal extended the operating hours from 10:30 p.m. to midnight in Gamecock B, C, and D MOAs and both Bulldog MOAs.

2002 Force Structure Change

By 2002, Shaw AFB was home to four squadrons of F-16 Block 50 aircraft – three 18 Primary Mission Aircraft Inventory (PMAI) squadrons and one 24 PMAI squadron (Air Force 2002). In FY 03, the Air Force deactivated the 78th Fighter Squadron and added 12 newer F-16 Block 50 aircraft to be distributed among other squadrons within the 20 FW. The 20 FW has the 55th, 77th, and 79th Fighter Squadrons and each squadron now has 24 PMAI Block 50 F-16 aircraft. Base personnel totals 5,663 after this force structure change.

Draft Airspace Training Initiative EIS

2003 Construction of an Assault Landing Strip

Dobbins Air Reserve Base completed construction of an assault landing strip to train crews of medium-sized aircraft such as C-130s. The assault landing strip has a 3,500 x 60-foot landing zone that will allow C-130H aircraft to practice take-offs and landings in conditions found in forward operating locations (Air Force Reserve 2003).

2003 Basing F/A-18E/F Aircraft at Oceana

The Department of the Navy recently announced its decision to home base the F/A-18E/F Super Hornet aircraft at Naval Air Station in Oceana, Virginia and Marine Corps Air Station (MCAS) at Cherry Point, North Carolina (Navy 2003). In addition, an outlying landing field is proposed for construction in Washington County, North Carolina. Introduction of the Super Hornet fleet to the East Coast and associated construction was expected to begin in 2004 and be completed by 2010. F/A-18E/F aircraft could use Shaw AFB-managed airspace as a transient and could replace other Navy or Marine transient aircraft currently using the airspace on an intermittent basis.

2003 Training Chaff and Flare Use

In 2003, Shaw AFB concluded an Environmental Assessment (EA) for the use of chaff and flares as defensive countermeasures for training in Bulldog A and B MOAs and Bulldog B Air Traffic Control Assigned Airspace (ATCAA), and Gamecock B, C and D MOAs and Gamecock D ATCAA (Air Force 2003). Three F-16 squadrons from Shaw AFB's 20 FW and one squadron from McEntire ANG's 169th Fighter Wing (169 FW) would use these airspace units for training with defensive chaff and flares.

2004 Employment of Mobile Laser Evaluation System at Poinsett ECR

In 2004, the Air Force further enhanced the Poinsett ECR by introducing a mobile laser evaluation system to score the accuracy of laser targeting and related training by 20 FW pilots. This targeting system provides rapid feedback to pilots and observers regarding the speed of targeting and the accuracy of targeting for new F-16 laser targeting systems.

PRESENT MILITARY ACTIONS

Shaw AFB, like any other major institution, also requires occasional new construction, facility improvements, and infrastructure upgrades. Current construction activities on base include a 31,920-square-foot Education Center in 2004 and new Aircraft Maintenance Units. Because ATI does not involve actions at Shaw AFB, construction or other activities at Shaw AFB would not be considered in the cumulative effects analysis.

Poinsett ECR continues to implement the range INRMP and the associated Operational Component Plans, particularly the Forestry Management Plan and red-cockaded woodpecker recovery efforts.

In addition, broader military projects are occurring in the region:

2005 Modifications to the Coastal MOA

The Georgia ANG and FAA are currently in the process of evaluating modifications to the Coastal MOA surrounding the Townsend Range near Jesup, Georgia. The airspace is approximately 100 miles south of the Bulldog MOA and is outside the unrefueled range of Shaw AFB aircraft. It is not regularly used for Shaw AFB or McEntire ANG's pilot training and would not interact with proposed ATI airspace changes.

2005 Wing Infrastructure Development Plan

Shaw AFB is in the process of completing an EA for its Wing Infrastructure Development Outlook (WINDO) Plan. This plan allows for infrastructure development and improvement projects at Shaw AFB and Poinsett ECR. In general, types of activities included in the WINDO Plan would involve construction of new base facilities; upgrade, repair, and alterations of facilities and infrastructure; replacement and expansion of facilities; and demolition of facilities. These base activities do not interact with or affect the ATI proposal or alternatives.

REASONABLY FORESEEABLE MILITARY ACTIONS

This category of reasonably foreseeable actions includes military actions that have a potential to coincide, either partially in time or geographic extent, with the Proposed Action or alternatives. One reasonably foreseeable military action could be the result of Congress' authorized Base Realignment and Closure (BRAC) round for 2005. When approved by Congress and signed by the President, BRAC has the potential to affect missions and training assignments at most military installations. Should such mission changes occur at Shaw AFB in conjunction with BRAC, a separate environmental analysis would be conducted as directed by Congress.

4.1.1.2 OTHER FEDERAL ACTIONS

Other past, current, and future federal actions in the area could also contribute to cumulative effects of the Proposed Action or alternatives. Federal agencies with jurisdiction within the ROI include the Bureau of Reclamation, United States Army Corps of Engineers (USACE), United States Fish and Wildlife Service (USFWS), United States Department of Agriculture (USDA), FAA, Federal Highway Administration, and Federal Energy Regulatory Commission. Potential actions within the area and occurring in the same time frame as ATI were identified and considered in preparation of this cumulative effects analysis.

UNITED STATES DEPARTMENT OF AGRICULTURE, UNITED STATES FOREST SERVICE

Two national forests in and near the ROI have recently revised their Land and Resource Management Plans. These are the Francis Marion National Forest (United States Forest Service [USFS] 1996) and the Sumter National Forest (Bailey 1995). The Sumter National Forest is immediately outside the ROI in the northwest. The Francis Marion National Forest is within the ROI for the proposed training transmitter sites along the South Carolina coast, although no proposed transmitter sites are within the National Forest.

FEDERAL AVIATION ADMINISTRATION

The FAA has recently published its *National Aviation Research Plan 2004*. The plan includes goals to increase the safety and efficiency of the National Airspace System (NAS).

4.1.1.3 NON-FEDERAL ACTIONS

Non-federal actions include projects of the State of South Carolina, State of Georgia, various counties within the ROI, cities within the ROI, and private projects. Several counties have published county land use and development plans and projects. Private actions are numerous and often difficult to identify; several identified private and commercial projects are summarized below.

The Nature Conservancy recently purchased two conservation easements near Fort Bragg. The Pee Dee Resource Conservation and Development Area Council recently published the Pee Dee Resource Conservation Plan. Many state, county, and city governments as well as local private entities and citizens have participated in the development of the plan. If a training transmitter site, such as the one near Georgetown, intersected lands affected by the Pee Dee Resource Conservation Plan, the plan would be considered in any transmitter construction activity.

Several local private airports have implemented or are in the process of implementing major improvements. These airport projects are summarized in Table 4.1-2. Other regional aviation facility ongoing and proposed activities are addressed in Section 3.1, Airspace Management and Air Traffic Control.

Table 4.1-2. Private Airport Projects

<i>Airport</i>	<i>Project Description</i>	<i>Time Frame</i>
Myrtle Beach International Airport	Private heliport developed.	2002
Myrtle Beach International Airport	Northwest Airlines added a route between Detroit and Myrtle Beach.	2004
Myrtle Beach International Airport	Spirit Airlines added daily flights between Washington D.C. and Myrtle Beach.	2004
Swainsboro/Emanuel County Airport	Potential improvements may include an Instrument Landing System (ILS).	2004–2005
Manning Airport	Proposed airport expansion.	2005
Louisville Airport	Recent improvements; a Localizer is scheduled for installation in 2005.	2004–2005

4.1.2 Cumulative Effects Analysis

The following analysis examines (1) how the impacts of the actions presented in the previous sections might be affected by any resulting from the Proposed Action or an alternative, (2) whether such a relationship could result in potentially significant impacts not yet identified when the Proposed Action or alternatives are considered together with the cumulative actions, and (3) what any cumulative impacts might be.

AIRSPACE MANAGEMENT AND AIR TRAFFIC CONTROL

Over the last decade, several military training airspace modifications have occurred to airspace overlying Georgia. These have included modifications to the Quick Thrust MOAs supporting operations on Townsend Range (R-3007), development of an assault landing strip at Dobbins

Air Reserve Base, and development of airspace to support search and rescue training conducted with HH-60 and HC-130 aircraft located at Moody AFB. All of these areas are located between 180 and 250 miles from Shaw AFB. None is in the immediate vicinity of any of the Special Use Airspace (SUA) considered in the ATI proposal. As noted in Section 2.7.1.3 of this EIS, training airspace at those distances does not support the operational criterion to optimize training time and minimize transit.

The military training airspace modification listed above have been implemented so as to not significantly impact the management or use of airspace by civil aviation. Implementation of ATI airspace changes, with management processes currently in place for the Gamecock MOAs, Poinsett MOAs, and the Poinsett Restricted Airspace, would not be expected to result in cumulative impacts to regional civil aviation.

In 2003, a Record of Decision (ROD) was published for the EIS assessing the deployment of F/A-18 E/F Super Hornet naval aircraft to the East Coast. In addition to other elements, this decision based 24 aircraft at MCAS Cherry Point in North Carolina. It is reasonable to assume that these units would use Shaw-managed training airspace as transients in the same manner that Navy and Marine aircraft currently occasionally use Shaw AFB managed airspace. Scheduling of this airspace would continue as under current procedures. Use of the existing and proposed ATI airspace by F/A-18E/F aircraft would not be expected to create any complication to airspace management.

Class C airspace has been designated around Myrtle Beach International Airport to manage traffic using the airport. This controlled airspace encompasses a 10-nautical-mile (NM) radius around the airport. Myrtle Beach is located east of Shaw AFB, and the controlled airspace abuts the eastern border of the current Gamecock C MOA. Since 2002, several initiatives have increased operations at this airport. A private heliport has been developed at the airport, and two additional commercial carriers (Northwest Airlines and Sprint Airlines) have begun providing scheduled service from the facility. Currently, all arrival and departure operations occur in the controlled airspace around the airport, and the additional commercial flights operate under Instrument Flight Rule (IFR) conditions, which means they are under positive control by Air Traffic Control (ATC) controllers at the airport. Considering these factors, no added impacts to airspace management would be anticipated. If the Proposed Action were selected, the airspace comprising the current Gamecock B MOA would be deleted, and the airspace would be returned to the NAS. This would produce a minor additional routing opportunity for aircraft arriving and departing from Myrtle Beach.

There are three airports under the Bulldog B MOA in the area of the proposed expansion of Bulldog A (Millen, Swainsboro/Emanuel County, and Waynesboro/Burke County). There is one privately owned airport under the proposed Gamecock E MOA (Palmetto Airport in Manning) and two public airports under the proposed lowered floor of Gamecock D and naming the lowered portion Gamecock F (Kingstree/Williamsburg County and Santee Cooper Regional). Hemmingway Stuckey Airport is beneath Gamecock C, and Robert F. Swinnie Airport underlies Gamecock C and D. Several of these airports are undergoing improvements and upgrading. Lake City Airport's Class E airspace penetrates Gamecock D. Existing

avoidance areas have been established and charted around the airports to avoid airspace encroachment in their operational areas. The current avoidance areas (see Section 3.1.3.1) consist of a 3-NM circle centered on the airport and extending up to 1,500 feet AGL. These avoidance areas would continue in effect, or be modified as required, to ensure that military training aircraft would not significantly affect airspace management. Adherence to these avoidance areas and communication about military use of the airspace are projected to avoid cumulative airspace management impacts under the ATI proposal.

NOISE

Since 1996, several changes in the number and type of aircraft stationed at Shaw AFB have occurred. In 1996, the movement of 18 Block 50 F-16 C/D aircraft from Cannon AFB, New Mexico, to Shaw AFB, South Carolina, and the movement of 18 A/OA-10 aircraft from Shaw AFB, South Carolina to Pope AFB, North Carolina was environmentally assessed. In 2002, overall force structure changes at Shaw AFB were also environmentally assessed. The result of both assessments concluded that there were no significant noise impacts in the vicinity of Shaw AFB or under the training airspace. The result of these changes forms the baseline for operations at Shaw AFB. These operations are not projected to substantially change as a result of either the Proposed Action or an alternative.

The cumulative effects of transient use of the Shaw AFB managed airspace is not expected to be different from the conditions projected in Section 3.2.3. Transient usage of the airspace from the current Navy and Marine aircraft is not expected to be discernibly different from the current transient usage. None of the cumulative government or other projects is expected to result in a different noise effect than that described in Section 3.2.3. There are no projected cumulative noise effects.

In 2003, a ROD was published for the EIS assessing the deployment of F/A-18 E/F Super Hornet naval aircraft to the east coast. In addition to other elements, this decision based 24 aircraft at MCAS Cherry Point in North Carolina, and approved the development of an Outlying Landing Field (OLF) in Washington County, North Carolina. If the basing and landing field proceed as proposed, it is reasonable to assume that some of these units would use Shaw-managed training airspace as transient aircraft. F/A-18 aircraft are currently flying as transients in Shaw-managed airspace and are included in the noise analysis on MTRs and in MOAs. On MTRs, cumulative noise levels range from less than 35 DNLmr to 43 DNLmr. In MOAs, cumulative noise levels range from less than 35 DNLmr to 55 DNLmr (see Table 3.2-4). As the number of F/A-18E/F aircraft based at East Coast locations increases, transient use of the Shaw-managed airspace could change or proportionally increase. This would not be expected to create a significant cumulative impact. Although not major contributors to overall noise levels, low level aircraft could be noticed, and some people who noticed them could be annoyed (see Section 3.2.1). As presented in Table 3.2-7, the cumulative noise levels, which consider all MTR traffic and MOA training flights, increase in the portion of Bulldog A that is expanded under Bulldog B from approximately 35 to 37 DNLmr (Bulldog B only) to 50 DNLmr (Bulldog A/B). This change would be noticeable to residents under the airspace. The noise is below the level of 55 dB identified as a level to consider potential impacts by USEPA.

Nevertheless, the noise levels will increase as a result of military training and some individuals may be annoyed by the increased presence of military training aircraft and/or by the changed noise levels under the expanded Bulldog A MOA. Based on annoyance surveys, the level of highly annoyed people could be expected to increase from approximately one percent to approximately four percent highly annoyed under portions of the expanded Bulldog A MOA.

Noise levels under the Gamecock MOAs would generally decrease as a result of the expanded airspace volume and the re-distribution of training aircraft within that airspace volume. The two areas of increased noise would be under the new Gamecock E, where calculated noise levels (see Table 3.2-6) under the Proposed Action would increase from ambient conditions estimated to be 35 to 44 dB 90 percent of the time to an aircraft contribution of 36 DNLmr. This means that military training aircraft could be noticed but would not be discernible contributors to noise conditions.

Under Gamecock D/F, the calculated contribution of military aircraft to noise conditions would change from less than 35 to 37 DNLmr. This means that the cumulative effect of military training would move from an indiscernible part of the ambient noise environment to a possible discernible part of the noise environment. Under most conditions, the aircraft noise would not be noticed, but it could be discerned in areas where average noise conditions were near the estimated lower 35 dB ambient level 90 percent of the time.

The contribution and operation of training transmitter sites would not have a long-term cumulative effect upon noise.

SAFETY

There are no aspects of the Proposed Action or alternatives that have the potential to create cumulative ground, explosive, or flight safety impacts. Training activities conducted by the 20 FW will not significantly change under these proposals.

In 2003, the expanded use of chaff and flares in the Shaw-managed military training airspace was assessed with a finding of no significant impact. Chaff used (RR-188) is training chaff, and creates no interference with FAA ATC or other radars. The flare minimum release altitude of 5,000 feet above mean sea level (MSL) that burn out in approximately 400 feet provides an estimated 4,000-foot safety margin to ensure that no burning material reaches the ground.

Flare plastic parts, felt spacers, and aluminum wrapping materials fall to the ground whenever a flare is deployed. An estimated one chaff or flare part falls on the ground for approximately each 5 acres per year. Observation of most flare or chaff debris would be an annoyance, with the exception of the S&I device from the Multi Jettison Unit (MJU)-7 A/B flare. This device would fall with the force of a large hailstone and could cosmetically dent a vehicle or injure an unprotected human. No cumulative effects are anticipated beyond those described in Section 3.3.3, Safety.

In terms of flight safety, when the additional F-16s were stationed at Shaw AFB, the recorded Class A mishap rate for F-16 aircraft was 3.59 per 100,000 hours of flight. Between 1994 and 2001, Shaw AFB experienced six Class A mishaps. There have been no Class A mishaps between 2001 and 2005. As the F-16 aircraft type has matured, the Class A mishap rate for this

aircraft type has been reduced to the current statistic of 3.50 per 100,000 flying hours. The other major aircraft that may begin to use the Shaw-managed airspace is the Navy's F/A-18. This two-engined aircraft has demonstrated a safety rate of 3.34 Class A mishaps per 100,000 flying hours.

Class C airspace has been designated around Myrtle Beach International Airport to manage traffic using the airport. This controlled airspace encompasses a 10-NM radius around the airport. Myrtle Beach is located east of Shaw AFB and the controlled airspace abuts the eastern border of the current Gamecock B MOA. Since 2002, several initiatives have increased operations at this airport. A private heliport has been developed at the airport, and two additional commercial carriers (Northwest Airlines and Sprint Airlines) have begun providing scheduled service from the facility. All arrival and departure operations occur in the controlled airspace around the airport, and the additional commercial flights operate under IFR conditions, which means they are under positive control by ATC controllers at the airport. Considering these factors, no added impacts to flight safety would be anticipated. Under the Proposed Action, the airspace comprising the current Gamecock B MOA would be deleted, and the airspace would be returned to the NAS, affording additional routing opportunities for aircraft arriving and departing from Myrtle Beach.

Airspace management, discussed above, describes the airports and avoidance areas applied to the airports within the airspace. These avoidance areas benefit airspace management and also benefit safety by creating a separation between military aircraft and civil aircraft within the vicinity of an airport.

Aircraft controllers have control over civilian and military aircraft within the MOAs. Within the Gamecock MOAs, aircraft traffic is actively routed at altitudes and separate MOA airspaces that avoid conflict. This may be accomplished by routing civil aviation through inactive airspace or closing down a specific MOA for a period to allow the transit of civil aircraft.

The proposed expansion of Bulldog A would require that procedures be established in letters of agreement to allow IFR civil air traffic to operate at airports under Bulldog MOA when it was active, while providing for positive separation by ATC between military and civil aircraft.

Public scoping comments expressed concern about general aviation pilots using the MOA under "see-and-avoid" conditions. Pilots who commented expressed concern that a MOA in active use for training was considered unsafe even under see-and-avoid conditions. Improved communication and situational awareness were identified by commentors as desired to improve the safety of general aviation within an active MOA. A recent case of a military training aircraft collision with a crop duster was cited as an example of the unsafe conditions that could exist in an active MOA. Although this incident is still under investigation by the National Transportation Safety Board, it is known that on January 18, 2005, an Air Tractor crop duster and an Air Force T-37B training jet collided mid-air over southwestern Oklahoma. The pilot of the crop duster was killed; the two Air Force pilots successfully ejected, with one of them sustaining minor injuries.

AIR QUALITY

Analysis of the potential impacts from other Proposed Actions affecting the ROI have been or are currently being analyzed in separate NEPA documents. These actions are not directly related to the Proposed Action evaluated in this EIS, but are additional actions identified by the installation.

Implementation of the Proposed Action or an alternative would not have any long-term impacts to regional air quality. Private and public construction actions could result in emissions associated with construction activities and aircraft operations within the ROI. Air quality impacts from construction activities would be temporary and short-term in nature. As a result, cumulative impacts from the interaction of the proposed and alternative action with other actions are unlikely to contribute to degradation of air quality in the region. The Proposed Action or an alternative action would result in insignificant increases in ground-level air pollutant concentrations within the ROI, and there would be no incremental effects from the Proposed Action or an alternative when combined with other public or private action in the ROI.

PHYSICAL RESOURCES

No cumulative impacts to physical resources are expected from the Proposed Action or an alternative. There would be no cumulative effects from the use of training chaff or flares beyond the effects described in Section 3.5.3.

The only potential cumulative impact to physical resources could be from public or private construction occurring in the same areas as the proposed transmitter sites. The other components of ATI such as modifying airspace would not affect physical resources.

The proposed military construction projects and other federal government projects are not proposed in the vicinity of the proposed transmitter sites. No cumulative construction effect would occur. Construction upgrades to local airports would not be expected to occur in the same location or time frame as the transmitter site grading. Chaff and flare debris would not have cumulative effects upon physical resources. Such chaff and flare materials could result in a visible annoyance to an observer, but would not accumulate on the ground or in water bodies in quantities that could significantly affect soil or water quality.

The transmitter sites in Georgia do not conflict with any of the proposed projects listed in the cumulative resources Table 4.1-1. Potential transmitter site locations are not expected to affect the proposed Nature Conservancy easement area or various resource management plans or county-wide development projects. As part of the siting criteria described in Section 2.2.3, proposed locations for the transmitter sites will avoid areas adjacent to water bodies or wetlands.

BIOLOGICAL RESOURCES

No cumulative impacts to biological resources are expected from the Proposed Action or alternatives. Changes in noise levels in the ATI proposal are very small and would not impact wildlife. No other military proposals in the ROI are expected to result in increased noise levels or have cumulative effects beyond those described in Section 3.2.3. Improvements to private

airports in the vicinity of the ROI could result in increased air traffic through the ROI; however, the potential changes in noise levels are not expected to cumulatively be greater than described for the Proposed Action or alternatives.

Construction of a new training transmitter site is expected to disturb 0.6 acre. Biological resources within the approximately 15 acre fenced area for each site could be affected by the fencing. Because training transmitter sites would likely be located on agricultural land, these sites would not be expected to contribute cumulatively to habitat loss or species endangerment in the region.

CULTURAL RESOURCES

The Proposed Action and alternatives of the ATI encompass changes to airspace, chaff and flare use, and the installation of new training transmitters, three along the South Carolina coast and three inland in Georgia and South Carolina. There are no projected adverse effects to cultural resources as a result of the airspace or chaff use components of the Proposed Action or Alternatives A or B. Although unlikely, the possible adverse impact to a historic structure resulting from falling MJU-7 A/B residual material could ATI add to any adverse effects to cultural resources resulting from other projects, either recently completed, ongoing, or proposed within the ROI.

The installation of new training transmitters involves ground disturbing activities, which have the potential to adversely affect cultural resources. Preliminary examination of three potential locations for two training transmitters in Georgia identified an archaeological site at one, and an isolated artifact at another. A third location has not been selected yet. The cultural resources will be recorded to state standards, and be evaluated for NRHP eligibility in consultation with the Georgia SHPO. If eligible, the Air Force will comply with Section 106 of NHPA and consult with the SHPO to develop mitigation measures, with avoidance being the preferred measure. The third location in Georgia will also need to be evaluated for the presence of cultural resources. Although training transmitter locations in South Carolina have not yet been identified, the same conditions hold true there as in Georgia. These include the need for consultation with the South Carolina SHPO, identification and NRHP eligibility evaluation of cultural resources, and development of mitigation measures if any resources are eligible. If avoidance of a cultural resource is not possible, this could result in an effect that could add to potential effects to cultural resources resulting from other projects, whether recently completed, ongoing, or proposed within the project area.

LAND USE

During scoping, the primary area of public concern for ATI conflict with land use plans was with airport plans under the area proposed for the expansion of Bulldog A. Commentors desired improved communication, avoidance areas, and scheduling to avoid perceived potential conflicts between military training aircraft and planned airport upgrades designed to enhance community economies.

No specific aspects of ATI have been identified that would produce incremental land use impacts when added to other past, present, or reasonably feasible future actions. Land use,

resource, and management plans for federal, state, and local lands under the ROI continue to be updated and revised. ATI is not inconsistent with the general mission and goals of these plans. Plans for airport improvements and expansion in specific locations, as described in Section 4.1.1.3, would not be affected by ATI elements. Actions on private lands affect very specific areas within each county and for the most part, the scope of the actions is focused. The cumulative effects of the Proposed Action and alternatives would remain below the threshold of significance for land use and recreation resources.

SOCIOECONOMICS

The airspace modifications and related activities associated with the ATI proposal are not expected to have any significant adverse impacts to regional populations or economic activity in the ROI. The overall effects on local airports have been presented in Section 3.1.3. Economic pursuits in the region, including that related to aviation activity, will have less VFR flexibility. Airports with ILS systems would be under ATC and would not be affected. Regional economic activity is not expected to experience any major limitations or negative effects if the Proposed Action or an alternative were implemented separately or concurrently with cumulative actions. The incremental effects of ATI, in combination with reasonably foreseeable future actions described in the previous sections, would not be expected to create any significant or adverse cumulative effects to socioeconomic resources in the region.

ENVIRONMENTAL JUSTICE

Airspace use and related activities associated with the ATI proposal are not expected to have any significant adverse impacts separately or cumulatively on minority or low-income communities. The incremental effects of this proposal, in combination with potential impacts associated with the reasonably foreseeable future actions described in the previous sections, would also not be expected to have any cumulative effects on children.

4.2 OTHER ENVIRONMENTAL CONSIDERATIONS

4.2.1 Relationship Between Short-Term Uses and Long-Term Productivity

CEQ regulations (Section 1502.16) specify that environmental analysis must address "...the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity." Special attention should be given to impacts that narrow the range of beneficial uses of the environment in the long-term or pose a long-term risk to human health or safety. This section evaluates the short-term benefits of the proposed alternatives compared to the long-term productivity derived from not pursuing the proposed alternatives.

A short-term use of the environment is generally defined as a direct consequence of a project in its immediate vicinity. Short-term effects could include localized disruptions and higher noise levels in some areas. Under the ATI Proposed Action and alternatives, short-term uses of the environment would be negligible. There are no changes to the overall number of sorties flown by the 20 FW or the South Carolina ANG. Noise levels would change very little from current conditions. The relatively low noise effect can be attributed to the dispersion of the 20 FW and South Carolina ANG training flights into a larger volume of airspace. The military training that

occurs in the ATI airspace results in noise effects that are transitory in nature. Noise effects would be short term and would not be expected to result in permanent damage or long-term changes in wildlife and livestock productivity or habitat use.

The ATI proposal largely involves changes in airspace and would not significantly impact the long-term productivity of the land. Use of chaff and flares would not negatively affect the long-term quality of the land, air, or water. Airspace changes are procedural and do not affect long-term productive use of natural resources. Under the Proposed Action and Alternative A, 96 acres could be fenced although fewer than 4 graded acres are projected to have a change in land use at the proposed training transmitter sites. Alternative B could affect land use on 48 acres. However, actual construction impacts would be restricted to about 0.9 acres at each site. Therefore, long-term productivity of the land would be affected on only 5.4 acres for the Proposed Action and Alternative A and 2.7 acres for Alternative B. These acreages represent a negligible portion of the ROI.

4.2.2 Irreversible and Irretrievable Commitment of Resources

NEPA CEQ regulations require environmental analyses to identify “...any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented” (40 CFR Section 1502.16). Primary irreversible effects result from permanent use of a nonrenewable resource (e.g., minerals or energy). Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., disturbance of a cultural site) or consumption of renewable resources that are not permanently lost (e.g., old growth forests). Secondary impacts could result from environmental accidents, such as explosive fires. Natural resources include minerals, energy, land, water, forestry and biota. Nonrenewable resources are those resources that cannot be replenished by natural means, including oil, natural gas and iron ore. Renewable natural resources are those resources that can be replenished by natural means, including water, lumber and soil.

For the ATI Proposed Action and alternatives, most impacts are short term and temporary, or longer lasting but negligible. Wildlife may be temporarily disturbed by construction activities at the training transmitter sites and some native vegetation may be lost; however, these sites are expected to primarily be located on agricultural land, thereby minimizing impacts to wildlife and native vegetation. Military training necessarily involves consumption of nonrenewable resources, such as fuel for vehicles and aircraft. However, training operations are not projected to change from current levels under ATI, so no increase in energy consumption is expected. No irreversible or irretrievable effects are expected for cultural resources or other natural resources, including land and water.

Secondary impacts to natural resources could occur in the unlikely event of an accidental fire caused by an aircraft mishap or flare. However, while any fire can affect agricultural resources, wildlife, and habitat, the increased risk of fire hazard due to operations under the Proposed Action or alternatives is very low.